National Institute of Environmental Health Sciences

Impact of high temperatures on hospital admissions: Comparative analysis with previous studies about mortality (Madrid)

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Abstract:

BACKGROUND: Heat wave prevention plans are traditionally implemented according to a temperature limit above which mortality begins to rise. Although these prevention plans are obviously designed to avoid deaths, it is also necessary to establish the impact of extreme temperatures on hospital admissions in order to put hospital alert plans into action for dealing with people affected by heat wave victims. METHODS: We used data on daily emergency admissions between May and September, from 1995 to 2000, in the Hospital General Universitario Gregorio Maranon in Madrid. The causes for admission were considered as 'organic' (International Classification of Diseases, ICD-9: 1-799), circulatory (ICD-9: 390-459) and respiratory (ICD-9: 460-519). We stratified them according to the following age groups: all ages, from 0 to 10, 18 to 44, 45 to 64, 65 to 74 and above 75 years. The methodology used was Autorregresive Integrated Moving Average (ARIMA) modelling, including variables related to atmospheric pollution, seasonality and trends. RESULTS: The results show that the temperature above which hospital admissions soar coincides with the temperature limit above which mortality sharply rises, which, in turn, coincides with percentile 95 of the maximum daily temperature series for summer months. The pattern of hospital admissions is completely different from that of mortality. The rise in hospital admissions due to all causes and age groups is clearly smaller than that detected for mortality. Discussion: These results suggest that people die rapidly from circulatory diseases before they can be admitted to hospital. This datum is vital with regard to implementing prevention plans prior to the arrival of the heat wave, if they are to effectively reduce mortality.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Air Pollution, Temperature

Air Pollution: Interaction with Temperature, Ozone, Particulate Matter, Other Air Pollution

Air Pollution (other): NOx, SO2

Temperature: Extreme Heat

Geographic Feature:

resource focuses on specific type of geography

Urban

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Europe

European Region/Country: European Country

Other European Country : Spain

Health Impact:

specification of health effect or disease related to climate change exposure

Cardiovascular Effect, Morbidity/Mortality, Respiratory Effect

Cardiovascular Effect: Other Cardiovascular Effect

Cardiovascular Disease (other): cardiovascular hospital admission

Respiratory Effect: Other Respiratory Effect

Respiratory Condition (other) : respiratory hospital admission

Mitigation/Adaptation:

mitigation or adaptation strategy is a focus of resource

Adaptation

Population of Concern: A focus of content

Population of Concern:

populations at particular risk or vulnerability to climate change impacts

Children, Elderly

Resource Type:

format or standard characteristic of resource

Research Article

Resilience:

capacity of an individual, community, or institution to dynamically and effectively respond or adapt to shifting climate impact circumstances while continuing to function

A focus of content

Timescale:

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content